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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,309	01/05/2005	Bhavin S. Khatri	GB 020114	2522

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EXAMINER

SANTIAGO CORDERO, MARIVELISSE

ART UNIT	PAPER NUMBER
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2617

MAIL DATE	DELIVERY MODE
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06/27/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/520,309

Applicant(s)

KHATRI ET AL.

Examiner

Marivelisse Santiago-Cordero

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

1. Claims 1-14 are pending in this application.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The references cited in the Information Disclosure Statement (IDS) filed on 11/3/2005 have been considered.

Specification

4. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. **The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided.** The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

5. The disclosure is objected to because of the following informalities: the term "16S" (page 8, line 24) should be replaced with --16A--.

Appropriate correction is required.

Claim Objections

6. Claims 2-7 and 9-14 are objected to because of the following informalities: the term "charaterised" (each of claims 2-7 and 9-14, line 1) should be replaced with --characterized--; the

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term “polarisation” (claims 7 and 14, line 2) should be replaced with --polarization--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-3 and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Moustakas et al. (hereinafter “Moustakas”; Patent No.: 6,380,910).

Regarding claim 1, Moustakas discloses a multiple transmission channel wireless communication system (col. 5, lines 33-36; col. 6, lines 51-53; col. 13, lines 33-39) comprising a transmitting station (10) and at least one receiving station (12) (col. 5, lines 33-36), at least one of said stations having an antenna system (14) comprising a plurality of spaced apart antenna elements (16A,B) (col. 5, lines 39-52), each antenna element comprising a sub-array of at least 2 antennas (20A,B) separated by less than $\lambda/2$ of the frequency of interest (col. 5, lines 39-52; col. 9, lines 28-42; col. 11, lines 6-10).

Regarding claim 2, Moustakas discloses a system as claimed in claim 1, characterized in that the antennas (20A,B) of a sub-array are coupled to an RF network (18A,B) for processing signals received by the antennas (Fig. 7, reference 702; col. 12, line 64 through col. 13, line 21).

Regarding claim 3, Moustakas discloses a system as claimed in claim 1 or 2, characterized in that the antennas (20A,B) of each sub-array are spaced apart by less than $\lambda/4$ (col. 10, lines 12-15 and 57-65; col. 11, lines 52-64).

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Regarding claim 8, Moustakas discloses an antenna system for use in a multiple transmission channel wireless communication system, the antenna system (col. 5, lines 33-36; col. 6, lines 51-53; col. 13, lines 33-39) comprising a plurality of spaced apart antenna elements (16A,B), each antenna element comprising a sub-array of at least 2 antennas (20A,B) separated by less than $\lambda/2$ of the frequency of interest (col. 5, lines 39-52; col. 9, lines 28-42; col. 11, lines 6-10).

Regarding claim 9, Moustakas discloses an antenna system as claimed in claim 8, characterized in that the antennas (20A,B) of a sub-array are coupled to an RF network (18A,B) for processing signals received by the antennas (Fig. 7, reference 702; col. 12, line 64 through col. 13, line 21).

Regarding claim 10, Moustakas discloses an antenna system as claimed in claim 8 or 9, characterized in that the antennas (20A,B) of each sub-array are spaced apart by less than $\lambda/4$ (col. 10, lines 12-15 and 57-65; col. 11, lines 52-64).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 4-7 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moustakas in view of Evans et al. (hereinafter "Evans"; WO 99/55012).

Regarding claim 4, Moustakas discloses a system as claimed in claim 1 (see above). Moustakas fails to disclose characterized in that a hybrid coupler (42A,B) couples together the antennas of each sub-array.

However, Evans discloses a sub array of at least 2 antennas characterized in that a hybrid coupler (42A,B) couples together the antennas of each sub-array (Abstract; Fig. 5, reference 502).

Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to couple together the antennas of each sub-array of Moustakas with a hybrid coupler as suggested by Evans.

One of ordinary skill in this art would have been motivated to couple together the antennas of each sub-array with a hybrid coupler because it enables two beam patterns to be available simultaneously for signal quality measurement and comparison (Evans: Abstract).

Regarding claim 5, Moustakas discloses a system as claimed in claim 1 or 2 (see above). Moustakas fail to disclose characterized in that the antennas (20A,B) of a sub-array are switchable to achieve directional propagation or reception.

However, Evans discloses a sub array of at least 2 antennas characterized in that the antennas (20A,B) of a sub-array are switchable to achieve directional propagation or reception (Abstract; Fig. 2).

Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to characterize the system of Moustakas in that the antennas of a sub-array are switchable to achieve directional propagation or reception as suggested by Evans.

One of ordinary skill in this art would have been motivated to the system in that the antennas of a sub-array are switchable to achieve directional propagation or reception because it would present a low impedance connection in the on state and a substantially reactive load to the antenna in the off state (Evans: Abstract).

Regarding claim 6, Moustakas discloses a system as claimed in claim 1 (see above). Moustakas fail to disclose characterized in that the antenna systems (14) form multiple orthogonal antenna beam patterns.

However, Evans discloses an antenna system characterized in that the antenna systems (14) form multiple orthogonal antenna beam patterns (Fig. 7; page 12, lines 8-21).

Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to characterize the antenna system of Moustakas to form multiple orthogonal beam patterns as suggested by Evans.

One of ordinary skill in this art would have been motivated to characterize the antenna system to form multiple orthogonal beam patterns because it would add the ability to generate antenna patterns in different directions (Evans: page 1, lines 15-17).

Regarding claim 7, Moustakas discloses a system as claimed in claim 1 or 2 (see above). Moustakas fails to disclose characterized in that the sub-arrays comprise antennas (20) arranged to give orthogonal polarization.

However, Evans discloses an antenna system characterized in that the sub-arrays comprise antennas (20) arranged to give orthogonal polarization (Fig. 7; page 12, lines 8-21).

Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to characterize the sub-arrays of Moustakas to comprise antennas arranged to give orthogonal polarization as suggested by Evans.

One of ordinary skill in this art would have been motivated to characterize the sub-arrays to comprise antennas arranged to give orthogonal polarization because it would add the ability to generate antenna patterns in different directions (Evans: page 1, lines 15-17).

Regarding claims 11-14, the limitations are rejected with the same grounds and for the same reasons and motivations stated above for claims 4-7, respectively.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lin (Patent No.: 6,532,359), Vaughan et al. (Patent No.: 5,771,022), Gardner et al.

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(Patent No.: 5,260,968) and Kapoor et al. (Patent No.: 6,795,424 and Pub. No.: 2002/0105928)

disclose antenna arrays.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marivelisse Santiago-Cordero whose telephone number is (571) 272-7839. The examiner can normally be reached on Monday through Friday from 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on (571) 272-7872. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MSC 6/5/07

MSC



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